REMARKS

Applicants thank the Examiner for the Office Action of August 18, 2009. This Amendment is in full response thereto. Thus, Applicants respectfully request continued examination and allowance of the application.

Claims 16-26, 29 and 30 are pending in this application.

Claim Rejections Under 35 U.S.C. § 112:

Claims 25 and 26 stand rejected under 35 U.S.C. § 112, first paragraph, because the specification, while being enabling for the third block being between first and second blocks and the first block having the limitation of claim 25 paragraph (a); does not reasonably provide enablement for the limitations in claim 25 paragraph (b) and (c). Applicant believes that the claims 25-26 presented in the April 1, 2009 Response were enable because the third block was surrounded on each side by a first block and a second block. Thus, those claims recited a first and second blocks on one side of the third block and first and second blocks on the other side of the third block. However, in order to especially emphasize this point, Applicant has amended the claims to recite that the third block surrounded on each side by a set of blocks comprising, in order, a first block and a second block. Thus, the claims require from left to right: a second block, a first block, a third block, a first block, and a second block. Because the third block is in the middle, it is possible for the fifth oxygenated-gas injection orifice to be placed at a distance ℓ_2 from the fuel injection orifice, while at the same time, the third and fourth oxygenated-gas injection orifices are each placed at a distance ℓ_2 from the fuel injection orifice. Thus, the rejection should be withdrawn.

First Claim Rejection Under 35 U.S.C. § 103:

Claims 16-26 and 29-30 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Dugue, et al. (USPN 6,910,879) in view of Khinkis (USPN 4,761,132). Claim 22 has been canceled. With respect to claims 16-21, 23-26 and

29-30, Applicant respectfully traverses because Dugue, et al. fails to disclose, teach or suggest all of the limitations of the claims, in particular, the area of the cross section of the injection orifice for the oxygen-lean oxygenated gas is between 4 and 100 times the area of the injection cross section for the second oxygen-rich oxygenated gas.

The Examiner takes the position that this limitation is a matter of design choice claiming that the Applicant has failed to disclose the significance of the range "between 4 and 100 times". Applicant kindly reminds the Examiner that, in an obviousness rejection, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. *KSR International Co. v. Teleflex Inc., et al.*, 550 U.S. 398, at __; 82 U.S.P.Q.2D (BNA) 1385, at __. The Examiner has not explained why this range is a mere design choice other than to conclusorily state that, based upon lines 8-10 and 29-32 of column 3 of Dugue, the cross-sectional area of injection of the oxygen-lean gas is more than seventeen times the cross-sectional area of injection of the oxygen-rich gas. Applicant fails to see how the Examiner concludes this and kindly requests that the Examiner show the necessary equation/derivation.

Despite the Examiner's failure to show how Dugue discloses the above-recited limitation or why the limitation is a mere design choice, the above-recited limitation is important for the following reasons.

Combustion methods employing oxygenated gases generally use oxygen coming from continuous oxygen production units, such as a cryogenic unit or a VSA (vacuum swing adsorption) unit. To anticipate the risks of interruption in the supply of oxygen coming from these units, a liquid oxygen reservoir is generally provided near the place where the combustion takes place. To reduce the storage costs of this tank and to avoid storing too large an amount of oxygen, which could classify the combustion site as a high accident risk site, it is generally preferred to reduce the capacity of this storage tank. However, this reduction in storage capacity does not always allow the combustion to be fed for a long enough time during an interruption

in supply.

One solution would be to supply the combustion with air, but generally burners employing a gas richer in oxygen than air do not permit the use of a large flow of air. Without further modification, the air would have to be injected through the nozzle used for injection of the oxygen-rich gas. Because the air contains a larger amount of nitrogen, the air injection would require a higher velocity in order to maintain the same amount of oxygen necessary for combustion with the fuel. A higher velocity would significantly change the flame shape and length. Such changes in the shape and the length of the flame and in the type of combustion are generally undesirable and may lead to changes in heating efficiency, changes in product-quality and damage to the furnace (flame impact and hot spots).

On the other hand, the present invention allows a burner to be operated with air in the event of an interruption in the continuous supply of the oxygen-rich gas that it is usually operated with. By providing an orifice for injecting the oxygen-lean gas (such as air) that is 4 to 100 times larger than the orifice for injection of the second injection of oxygen-rich gas, no drastic increase in velocity is required in order to provide a same amount of oxygen for combustion with the fuel. Thus, the flame shape and heat transfer uniformity are not deleteriously impacted.

In conclusion, because the Examiner has not provided a rejection meeting the legal standard reiterated by the Supreme Court and because the invention provides a significant and non-obvious solution to a problem in the field of art, the rejection should be withdrawn.

Second Claim Rejection Under 35 U.S.C. § 103:

Claim 24 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Dugue, et al. (USPN 6,910,879) in view of Khinkis (USPN 4,761,132) and further in view of Koppang, et al. (USPN 5,759,022). Applicant respectfully traverses because the combination of Dugue, et al. and Khinkis fails to disclose, teach or suggest all of the limitations of the claim (as explained above with regard to claim 16) and because

Koppang, et al. fails to cure their deficiencies. Thus, the rejection should be withdrawn.

Third Claim Rejection Under 35 U.S.C. § 103:

Claims 25-26 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Dugue, et al. (USPN 6,910,879). Applicant respectfully traverses because Dugue, et al. fails to disclose, teach, or suggest all of the limitations of the claims, in particular, that the fourth oxygenated-gas injection orifice has an area of between 4 and 100 times the area of the third orifice as described above with regard to claim 16. Thus, the rejection should be withdrawn.

CONCLUSION

Accordingly, it is believed that the present application now stands in condition for allowance. Early notice to this effect is earnestly solicited. Should the examiner believe a telephone call would expedite the prosecution of the application, he/she is invited to call the undersigned attorney at the number listed below.

It is not believed that any fee is due at this time. If that belief is incorrect, please debit deposit account number 01-1375. Also, the Commissioner is authorized to credit any overpayment to deposit account number 01-1375.

Respectfully submitted,

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